

CLAIMS

1. A hydraulic apparatus comprising:
a hydrostatic transmission mounted in a first sump, the hydrostatic
5 transmission comprising a pump, the pump connected to a hydraulic circuit;
a second sump in fluid communication with the first sump and the
hydraulic circuit;
a filter located between the first sump and the second sump to filter liquid
flowing from the first sump into the second sump; and
10 an opening associated with the second sump to permit air to move from
the second sump to the first sump.
2. The hydraulic apparatus as set forth in Claim 1, further comprising a
poppet disposed within the opening, wherein the poppet cooperates with the opening to
15 provide an open position and a closed position.
3. The hydraulic apparatus as set forth in Claim 2, wherein the poppet is
forced into the open position as the result of the air located in the second sump.
- 20 4. The hydraulic apparatus as set forth in Claim 2, wherein the poppet is
biased in the closed position.
5. The hydraulic apparatus as set forth in Claim 1, further comprising a
center section on which the sump and motor are mounted, wherein the hydraulic circuit
25 is formed in the center section.
6. The hydraulic apparatus as set forth in Claim 5, wherein the filter
comprises a filter housing secured to the center section and a filter element secured to
the filter housing.

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7. The hydraulic apparatus as set forth in Claim 1, wherein the hydrostatic transmission further comprises a motor connected to the pump.

8. A hydraulic drive apparatus comprising:

5 a hydrostatic transmission mounted in a sump and comprising a rotatable pump block connected to a rotatable motor block through a hydraulic circuit;

filter means for filtering liquid entering the hydraulic circuit from the sump;

and

means for venting the filter means to permit air to escape from the filter

10 means to the sump.

9. A hydraulic drive apparatus comprising:

a hydrostatic transmission mounted in a sump and comprising a rotatable pump block connected to a rotatable motor block through a hydraulic circuit;

15 filter means for filtering liquid entering the hydraulic circuit from the sump;

and

means for guiding air to an opening disposed in the hydraulic circuit.

10. The hydraulic drive apparatus of Claim 9, wherein the means for guiding
20 air to the opening comprises at least one slanted surface.

11. The hydraulic drive apparatus of Claim 9, wherein the means for guiding air to the opening comprises a chimney.

25 12. The hydraulic drive apparatus of Claim 9, wherein the means for guiding air to the opening comprises at least one slanted surface adjacent a chimney in which the opening is formed.

30 13. The hydraulic drive apparatus of Claim 9, wherein a poppet positioned in the opening is biased by liquid to block the opening.

14. The hydraulic drive apparatus of Claim 13, wherein the presence of air adjacent to the poppet forces the poppet into a position to permit the air to exit the filter through the opening.

5 15. A method of removing air from a hydrostatic drive device, the method comprising the steps of:

disposing a filtering device within the hydrostatic drive device, the filtering device comprising a filter housing and a filter attached thereto;

10 biasing a poppet in an upper portion of the filtering device in an open and a closed position;

allowing a fluid to pass through the filter and into the filter housing, the fluid including a liquid and air; and

permitting the escape of the air from the filter housing through the opening.

15 16. The method of Claim 15, wherein the poppet is biased in the closed position as a result of pressure exerted on the poppet by the fluid surrounding the filter housing.

20 17. The method of Claim 16, wherein the air is permitted to escape from the filter housing when pressure inside the filter housing is greater than that of the pressure exerted on the poppet from outside the filter housing.